CLAIMS

1. An audio user-interfacing method in which items are represented in an audio field by respective synthesized sound sources from where sounds related to the items appear to emanate, the method comprising the steps of:

(a) setting the location of each sound source relative to an associated one of multiple audio-field references;

(b) independently controlling an offset between each audio-field reference and a presentation reference determined by a mounting configuration of audio output devices through which the sound sources are rendered in the audio field,

(c) determining a rendering position for each sound source based on its location set in step (a) and the offset of the associated audio-field reference;

(d) rendering said sound sources at their associated rendering positions in the audio field.

2. A method according to claim 1, wherein in step (b) the offset of each audio-field reference is controlled such as to stabilise the associated sound sources relative to one of:

- a user's head;
- a user's body;
- a vehicle in which the user is travelling;
- the world;

this stabilisation taking account of whether the audio output devices used to render the sound sources are world, vehicle, body or head mounted, and, as appropriate, rotation of the user's head or body, or turning of the vehicle.

3. A method according to claim 2, wherein the offsets of first and second ones of the audio-field references are independently controlled to apply different respective stabilisations to the sound sources respectively associated with these audio field references.

4. A method according to claim 1 or claim 2, wherein in step (b) the offset of each audio-field reference is independently controllable by a user input.

5. A method according to claim 1, wherein at least some of the said items represented by the sound sources are audio labels for services, the method further involving user selection of a service by selection of the corresponding audio-label sound source.

6. A method according to claim 1, wherein one said item is an audio cursor having an associated distinctive sound which is output through the related synthesised sound source, the audio cursor being associated with its own respective one of said audio-field references with the offset of this audio-field reference being controllable by user input to move the audio cursor sound source in the audio field.

7. A method according to claim 6, wherein the cursor-associated audio-field reference is stabilised relative to one of:

- a user's body;
- a user's head;

this stabilisation taking account of whether the audio output devices used to render the sound sources are world, vehicle, body or head mounted, and, as appropriate, rotation of the user's head or body.

8 A method according to claim 6, including the further step of a user selecting a non-cursor item by aligning the audio cursor with the corresponding non-cursor sound source and providing a selection command input.

9. A method according to claim 8, wherein at least some of the said non-cursor items represented by the sound sources are audio labels for services, the method further involving a user selecting a service by selecting the corresponding audio-label item using the audio cursor.

10. A method according to claim 1, wherein one said item is a real-world direction label for indicating a real-world direction through the related synthesised sound source, the offset of the audio-field reference associated with this sound source being controlled to stabilise the sound source relative to the world taking account of whether the audio output

devices used to render the sound sources are world, vehicle, body or head mounted, and, as appropriate, rotation of the user's head or body, or turning of the vehicle.

11. A method according to claim 10, wherein at least one further item has its sound source associated with the same audio-field reference as the sound source of the said real-world direction label, the or each said at least one further item being a further real-world direction label for indicating a respective real-world direction.

12. A method according to claim 10, wherein in response to user request, the current direction of facing of the user, in real world terms, is indicated through a corresponding sound source rendered in the audio field in line with the user's current facing direction.

13. A method according to claim 12, wherein said real-world terms is a compass bearing.

14. A method according to claim 12, wherein said real-world terms is an identifier of what lies in the user's facing direction in the real world.

15. Audio interface apparatus in which items are represented in an audio field by respective synthesized sound sources from where sounds related to the items appear to emanate, the apparatus comprising:

- rendering means, including audio output devices, for rendering said sound sources at respective associated rendering positions in the audio field;
- location-setting means for setting the location of each sound source relative to an associated one of multiple audio-field references;
- offset means for independently controlling an offset between each audio-field reference and a presentation reference determined by a mounting configuration of said audio output devices; and
- rendering-position determining means for determining the rendering position for each sound source based on its location set by the location-setting means and the offset of the associated audio-field reference.

16. Apparatus according to claim 15, wherein the offset means is operative to control the offset of each audio-field reference such as to stabilise the associated sound sources relative to one of:

- a user's head;
- a user's body;
- a vehicle in which the user is travelling;
- the world;

this stabilisation taking account of whether the audio output devices are world, vehicle, body or head mounted, and, as appropriate, rotation of the user's head or body, or turning of the vehicle.

17. Apparatus according to claim 16, wherein the offset means is operative to independently control the offsets of first and second ones of the audio-field references to apply different respective stabilisations to the sound sources respectively associated with these audio field references.

18. Apparatus according to claim 15 , wherein the offset means includes user-input means through which a user can independently control the offset of each audio-field reference.

19. Apparatus according to claim 15, wherein at least some of the said items represented by the sound sources are audio labels for services, the apparatus further comprising user-operable selection means for selecting a service by selecting the corresponding audio-label sound source.

20. Apparatus according to claim 15, wherein one said item is an audio cursor having an associated distinctive sound which is arranged to be output through the related synthesised sound source, the audio cursor being associated with its own respective one of said audio-field references, the offset means including user input means for controlling the offset of the audio-field reference associated with the to move the audio cursor sound source in the audio field.

21. Apparatus according to claim 20, wherein the offset means is operative to control the offset of the cursor-associated audio-field reference such as to stabilise the cursor sound source relative to one of:

- a user's body;
- a user's head;

this stabilisation taking account of whether the audio output devices are world, vehicle, body or head mounted, and, as appropriate, rotation of the user's head or body.

22. Apparatus according to claim 20, further comprising user-operable selection means for selecting a non-cursor item by providing selection command input after the audio cursor has been aligned with the sound source corresponding to the non-cursor item to be selected.

23. Apparatus according to claim 22, wherein at least some of the non-cursor items represented by the sound sources are audio labels for services, the selection means by operable to select a service by selecting the corresponding audio-label item.

24. Apparatus according to claim 15, wherein one said item is a real-world direction label for indicating a real-world direction through the related synthesised sound source, the offset means being operative to control the offset of the audio-field reference associated with this sound source to stabilise the sound source relative to the world taking account of whether the audio output devices are world, vehicle, body or head mounted, and, as appropriate, rotation of the user's head or body, or turning of the vehicle.

25. Apparatus according to claim 24, wherein at least one further item has its sound source associated with the same audio-field reference as the sound source of the said real-world direction label, the or each said at least one further item being a further real-world direction label for indicating a respective real-world direction.

26. Apparatus according to claim 24, further comprising direction-indicating means responsive to user request, to indicate the current direction of facing of the user, in real world terms, through a sound source rendered in the audio field in line with the user's

current facing direction,.

27. Apparatus according to claim 26, wherein said real-world terms is a compass bearing.

28. Apparatus according to claim 26, wherein said real-world terms is an identifier of what lies in the user's facing direction in the real world.

29. Audio interface apparatus in which items are represented in an audio field by respective synthesized sound sources from where sounds related to the items appear to emanate, the apparatus comprising:

- a rendering subsystem, including audio output devices, arranged to render said sound sources at respective associated rendering positions in the audio field;
- a location-setting arrangement for setting the location of each sound source relative to an associated one of multiple audio-field references;
- a control arrangement for independently controlling an offset between each audio-field reference and a presentation reference determined by a mounting configuration of said audio output devices; and
- a rendering-position determining arrangement operative to determine the rendering position for each sound source based on its location set by the location-setting arrangement and the offset of the associated audio-field reference.

30. Apparatus according to claim 29, wherein the control arrangement is operative to control the offset of each audio-field reference such as to stabilise the associated sound sources relative to one of:

- a user's head;
- a user's body;
- a vehicle in which the user is travelling;
- the world;

this stabilisation taking account of whether the audio output devices are world, vehicle, body or head mounted, and, as appropriate, rotation of the user's head or body, or turning of the vehicle.

31. Apparatus according to claim 30, wherein the control arrangement is operative to independently control the offsets of first and second ones of the audio-field references to apply different respective stabilisations to the sound sources respectively associated with these audio field references.

32. Apparatus according to claim 29, wherein the control arrangement includes user-input functionality through which a user can independently control the offset of each audio-field reference.

33. Apparatus according to claim 29, wherein at least some of the said items represented by the sound sources are audio labels for services, the apparatus further comprising a user-operable selection arrangement for selecting a service by selecting the corresponding audio-label sound source.

34. Apparatus according to claim 29, wherein one said item is an audio cursor having an associated distinctive sound which is arranged to be output through the related synthesised sound source, the audio cursor being associated with its own respective one of said audio-field references, the control arrangement including user input functionality for controlling the offset of the audio-field reference associated with the to move the audio cursor sound source in the audio field.

35. Apparatus according to claim 34, wherein the control arrangement is operative to control the offset of the cursor-associated audio-field reference such as to stabilise the cursor sound source relative to one of:

- a user's body;
- a user's head;

this stabilisation taking account of whether the audio output devices are world, vehicle, body or head mounted, and, as appropriate, rotation of the user's head or body.

36. Apparatus according to claim 34, further comprising user-operable selection arrangement for selecting a non-cursor item by providing selection command input after

the audio cursor has been aligned with the sound source corresponding to the non-cursor item to be selected.

37. Apparatus according to claim 36, wherein at least some of the non-cursor items represented by the sound sources are audio labels for services, the selection arrangement being operable to select a service by selecting the corresponding audio-label item.

38. Apparatus according to claim 29, wherein one said item is a real-world direction label for indicating a real-world direction through the related synthesised sound source, the control arrangement being operative to control the offset of the audio-field reference associated with this sound source to stabilise the sound source relative to the world taking account of whether the audio output devices are world, vehicle, body or head mounted, and, as appropriate, rotation of the user's head or body, or turning of the vehicle.

39. Apparatus according to claim 38, wherein at least one further item has its sound source associated with the same audio-field reference as the sound source of the said real-world direction label, the or each said at least one further item being a further real-world direction label for indicating a respective real-world direction.

40. Apparatus according to claim 38, further comprising direction-indicating functionality responsive to user request, to indicate the current direction of facing of the user, in real world terms, through a sound source rendered in the audio field in line with the user's current facing direction,.

41. Apparatus according to claim 40, wherein said real-world terms is a compass bearing.

42. Apparatus according to claim 40, wherein said real-world terms is an identifier of what lies in the user's facing direction in the real world.